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- a) storing data relating to a variable annuity account, including data relating to at least one of periodic benefit payments, a guaranteed minimum benefit payment, an assumed investment rate, a payout term and a period of benefit payments;
 - b) periodically determining an amount of a preliminary benefit payment under the plan, and comparing the amount determined with the guaranteed minimum benefit payment;
 - c) periodically determining an amount of the current benefit payment under the plan which is the greater of the preliminary benefit payment and the guaranteed minimum benefit payment;
 - d) maintaining a cumulative total of periodically determined preliminary benefit payments;
 - e) maintaining a cumulative total of periodically determined current benefit payments;
 - f) reducing the amount of the current benefit payment if the periodically determined preliminary benefit payment is greater than the guaranteed minimum payment, and the cumulative total of current benefit payments exceeds the cumulative total of preliminary benefit payments; and
 - g) paying the current benefit payment to the owner.

~~8.~~ The method of Claim 7, wherein the amount of the preliminary benefit payment is determined by the following formula:

$$\text{Benefit}_{t+1} = \text{Benefit}_t \times \left[\frac{1+i}{1+AIR} \right]^{\frac{1}{p}}$$


where: Benefit_{t+1} = dollar amount of variable annuity benefit at time t+1
 Benefit_t = dollar amount of variable annuity benefit at time t
 i = net fund performance during period t to t+1 (as a %)
 AIR = assumed investment rate for the period t to t+1
 p = the period of benefit payments.

~~9.~~ The method of Claim 7, wherein the data relating to a variable annuity account further includes data relating to a maximum payment amount.

~~10.~~ The method of Claim 9, further comprising the steps of comparing the periodically determined preliminary benefit payment to the maximum payment amount and adjusting the amount of the periodically determined preliminary benefit payment downwardly to the maximum payment amount if the periodically determined preliminary payment is greater than said maximum payment amount.

~~11.~~ A computerized method for administering a variable annuity benefit plan having a guaranteed minimum benefit payment feature, and for periodically determining the amount of a current benefit payment to be made to an owner under the plan, comprising the steps of:

- a) storing data relating to a variable annuity account, including data relating to at least one of periodic benefit payments, a guaranteed minimum benefit payment, an assumed investment rate, a payout term and a period of benefit payments;
- b) periodically determining an amount of a preliminary benefit payment;
- c) determining an amount of the current benefit payment from the preliminary benefit payment by:

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- 1) setting the amount of the current benefit payment to an amount which is less than the amount of the preliminary benefit payment if the preliminary benefit payment is greater than the guaranteed minimum payment, and if a cumulative total of previous benefit payments exceeds a cumulative total of previously determined preliminary benefit payments;
 - 2) setting the amount of the current benefit payment equal to the guaranteed minimum payment if the preliminary benefit payment is less than or equal to the guaranteed minimum payment; or
 - 3) otherwise, setting the amount of the current benefit payment equal to the amount of the preliminary benefit payment; and
 - d) paying the current benefit payment to the owner.

(12.) A computerized method for administering a variable annuity benefit plan having a guaranteed minimum payment feature, and for periodically determining the amount of a current benefit payment to be made to the owner under the plan, comprising the steps of:

- a) storing data relating to a variable annuity account, including data relating to at least one of an account value, a guaranteed minimum benefit payment, an assumed investment rate, survival probabilities, attained age annuity factors, a payout term and a period of benefit payment;
- b) periodically determining the account value and attained age annuity factor, and an amount of a preliminary benefit payment using the account value and attained age annuity factor;
- c) periodically determining an amount of the current benefit payment by comparing the guaranteed minimum benefit payment to the preliminary benefit payment and taking the larger of the two; and
- d) paying the current benefit payment to the owner.

~~13.~~ The method of Claim 12, wherein the account value is periodically determined by the following formula:

$$\text{Account Value}_{t+1} = (\text{Account Value}_t - \text{Payment}_t) \times (1 + i) \times (1/p_y)$$

Where: $\text{Account Value}_{t+1}$ = account value at time t+1

Account Value_t = account value at time t

Payment_t = dollar amount of the current benefit payment paid at time t

i = net fund performance during period t to t+1

P_y = probability that annuitant age y survives to age y+1.

~~14.~~ The method of Claim 12, wherein the preliminary benefit payment is periodically determined by the following formula:

$$\text{Benefit}_t = \text{Account Value}_t \setminus \text{AF}_t$$

Where: Benefit_t = dollar amount of current benefit payment at time t

Account Value_t = account value at time t

AF_t = attained age annuity factor at time t.

~~15.~~ A computerized method for administering a variable annuity benefit plan having a guaranteed minimum payment feature, and for periodically determining the amount of a current benefit payment to be made to the owner under the plan, comprising the steps of:

- a) storing data relating to a variable annuity account, including data relating to at least one of annuity units and unit values, an annuity reserve, a guaranteed minimum benefit payment, attained age annuity factors, a payout term and a period of benefit payments;
- b) periodically determining an amount of the annuity reserve;
- c) periodically determining an amount of a preliminary benefit payment under the plan, and comparing the amount determined with the guaranteed minimum benefit payment to determine any shortfall between the preliminary benefit payment and the guaranteed minimum benefit payment;

- d) periodically determining the current benefit payment by comparing the guaranteed minimum benefit payment to the preliminary benefit payment and taking the larger of the two; and
- e) paying the current benefit payment to the owner.

16. The method of Claim 15, wherein the preliminary benefit payment is periodically determined using the following formulas:

$$\text{Benefit}_{t+1} = \text{Benefit}_t \times [(1+i) \setminus (1+\text{AIR})]^{\frac{1}{p}} \times [1 - (\text{Shortfall}_t / \text{Reserve}_t)]$$

$$\text{Shortfall}_t = \text{Max}[\text{GuarMinPayment} - \text{Benefit}_t, 0]$$

$$\text{Reserve}_t = \text{Payment}_t \times \text{AF}_t$$

Where: Benefit_{t+1} = dollar amount of preliminary benefit payment at time t+1

Benefit_t = dollar amount of preliminary benefit payment at time t

i = net fund performance during period t to t+1

AIR = assumed investment rate

GuarMinPayment = guaranteed minimum benefit payment that is paid if Benefit_t is less

Shortfall_t = dollar amount that the guaranteed minimum benefit payment exceeds the preliminary benefit payment, Benefit_t

Payment_t = dollar amount of the current benefit payment paid to the owner at time t

AF_t = attained age annuity factor at time t

p = the period of benefit payments.

17. A computerized method for administering a variable annuity benefit plan having a minimum benefit payment feature, and for determining the amount of a periodic benefit payment to be made to an owner under the plan, comprising the steps of:

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- a) storing data relating to a variable annuity account, including an account value and a minimum benefit payment;
 - b) calculating a preliminary benefit payment in accordance with the terms of the annuity plan and using the previously stored account value;
 - c) comparing the preliminary benefit payment to the minimum benefit payment and setting the periodic benefit payment equal to the minimum benefit payment if the preliminary benefit payment is less than or equal to the minimum benefit payment, and setting the periodic benefit payment equal to the preliminary benefit payment if the preliminary benefit payment is greater than the minimum benefit payment;
 - d) calculating a new account value by reducing the preexisting account value by the amount of the periodic benefit payment;
 - e) storing the new account value and the amount of the periodic benefit payment; and
 - f) paying the periodic benefit payment to the owner.

~~18.~~ The method of Claim 17, further comprising the additional step of creating a master record for the variable annuity account, and wherein said storing steps include storing data on said master record.

~~19.~~ The method of Claim 18, wherein the step of creating a master record comprises the steps of providing an input screen having fields for entry of data relating to an annuitant, the type of annuity plan, relevant dates and amounts, and data relating to interest and mortality guarantees, entering data in the fields, and checking the data for validity and completeness.

~~20.~~ The method of Claim 19, further comprising the additional step of displaying the master record for visual checking by an operator, and storing the master record if the data is deemed to be satisfactory.

21. The method of Claim 17, wherein the step of calculating a preliminary benefit payment further comprises the step of retrieving previously stored data relating to annuity factors, survivor factors and annuity unit factors.

22. The method of Claim 17, comprising the additional step of determining the minimum benefit payment from a net amount available for purchase of the annuity plan, an annuity factor, and an annuity unit value.

23. The method of Claim 17, wherein the step of calculating the preliminary benefit payment comprises the steps of dividing the account value by a previously stored annuity factor.

24. The method of Claim 17, further comprising the additional step of generating a report, and forwarding the report to the annuitant.

25. The method of Claim 17, further comprising the additional steps of generating at least one report, and storing data in at least one of an accounting file for use in preparing process and accounting records, a valuation file for use in establishing reserves, a payment center file for use in preparing benefit checks and report to annuitants, and a customer service file for use in preparing screens for use by customer service personnel.

26. A computerized method for administering a variable annuity benefit plan having a minimum benefit payment feature, and for determining the amount of a periodic benefit payment to be made to an owner under the plan, comprising the steps of:

- a) storing data relating to a variable annuity account, including data relating to annuity units and annuity unit values, and a minimum benefit payment;
- b) calculating a preliminary benefit payment;
- c) comparing the preliminary benefit payment to the minimum benefit payment and setting the periodic benefit payment equal to the minimum benefit payment if the preliminary benefit payment is less than or equal to the minimum benefit payment,

and setting the periodic benefit payment equal to the preliminary benefit payment if the preliminary benefit payment is greater than the minimum benefit payment;

d reducing the annuity units by an amount proportional to an excess of the periodic benefit, as set in step c, over the preliminary benefit calculated in step b;

e) storing the amount of the periodic benefit and the number of annuity units; and

f) paying the periodic benefit payment to the owner.

~~27.~~ The method of Claim 26, further comprising the additional step of setting the number of annuity units to zero if the reduction of step d would otherwise result in the number of units being less than zero.

~~28.~~ The method of Claim 26, further comprising the additional step of creating a master record for the variable annuity account, and wherein said storing steps include storing data on said master record.

~~29.~~ The method of Claim 28, wherein the step of creating a master record comprises the steps of providing an input screen having fields for entry of data relating to an annuitant, the type of annuity plan, relevant dates and amounts, and data relating to interest and mortality guarantees, entering data in the fields, and checking the data for validity and completeness.

~~30.~~ The method of Claim 29, further comprising the additional step of displaying the master record for visual checking by an operator, and storing the master record if the data is deemed to be satisfactory.

~~31.~~ The method of Claim 26, wherein the step of calculating a preliminary benefit payment further comprises the step of retrieving previously stored data relating to annuity factors, and annuity unit factors.

32. The method of Claim 26, comprising the additional step of determining the minimum benefit payment from a net amount available for purchase of the annuity plan, an annuity factor, and an annuity unit value.

33. The method of Claim 26, further comprising the additional step of generating a report, and forwarding the report to the owner.

34. The method of Claim 26, further comprising the additional steps of generating at least one report, and storing data in at least one of an accounting file for use in preparing process and accounting records, a valuation file for use in establishing reserves, a payment center file for use in preparing benefit checks and reports for the owner, and a customer service file for use in preparing screens for use by customer service personnel.

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35. A computerized method for administering a variable annuity plan having a guaranteed minimum payment feature associated with a systematic withdrawal program, and for periodically determining an amount of a scheduled withdrawal payment to be made to the owner under the plan, comprising the steps of:

- a) storing data relating to a variable annuity account, including data relating to at least one of an account value, a withdrawal rate, a payout term and a period of benefit payments;
- b) determining an initial scheduled withdrawal payment;
- c) periodically determining the account value associated with the plan;
- d) monitoring for an unscheduled withdrawal made under the plan and adjusting the amount of the scheduled withdrawal payment in response to said unscheduled withdrawal; and
- e) periodically paying the scheduled withdrawal payment to the owner.

36. The method of Claim 35, wherein the amount of the scheduled withdrawal payment is determined by the following formula:

Withdrawal = Account Value₀ x WD Rate

Where: Withdrawal = dollar amount of the withdrawal payment

Account Value₀ = initial account value

WD Rate = % of the initial account value used to determine the initial scheduled withdrawal payment.

37. The method of Claim 35, wherein the account value is periodically determined by the following formula:

Account Value_{t+1} = Max[(Account Value_t - Withdrawal), 0] x (1+i)

Where: Account Value_{t+1} = account value at time t+1

Account Value_t = account value at time t

Withdrawal = dollar amount of the withdrawal payment at time t

i = net fund performance during period t to t+1.

38. The method of Claim 35, wherein the scheduled withdrawal payment is adjusted in response to an unscheduled withdrawal, according to the following formula:

Withdrawal' = Withdrawal x (1 + US Withdrawal/Account Value_t)

Where: Withdrawal' = withdrawal payment after an adjustment for an unscheduled withdrawal

Withdrawal = withdrawal payment prior to an adjustment for an unscheduled withdrawal

US Withdrawal_t = unscheduled withdrawal made at time t

Account Value_t = account value at time t, prior to the unscheduled withdrawal.

39. The method of claim 35, further comprising the additional step of creating a master record for the variable annuity account, and wherein said storing steps include storing data on said master record.

40. The method of Claim 39, wherein the step of creating a master record comprises the steps of providing an input screen having fields for entry of data relating to the owner, the type of annuity plan, relevant dates and amounts, and data relating to interest and mortality guarantees, entering data in the fields, and checking the data for validity and completeness.

41. The method of Claim 40, further comprising the additional step of displaying the master record for visual checking by an operator, and storing the master record if the data is deemed to be satisfactory.

42. The method of Claim 35, further comprising the additional step of generating a report, and forwarding the report to the owner.

43. The method of Claim 35, further comprising the additional steps of generating at least one report, and storing data in at least one of an accounting file for use in preparing process and accounting records, a valuation file for use in establishing reserves, a payment center file for use in preparing benefit checks and reports for the owner, and a customer service file for use in preparing screens for use by customer service personnel.

44. A computerized method for administering a variable annuity benefit plan having a feature that provides a stream of predefined systematic withdrawal payments and a subsequent stream of guaranteed annuity payments to be paid to the owner under the plan if the annuitant is living when systematic withdrawals cease and at the end of the liquidity period, comprising the steps of:

- a) storing data relating to the variable annuity account, including data relating to an account value, an assumed investment rate, withdrawal and annuity payments, a liquidity period, an annuity period, and an annuity payout option;
- b) during the liquidity period:
 - 1. determining a special annuity factor;
 - 2. determining an amount of an initial withdrawal payment;

3. periodically determining the account value associated with a variable annuity contract;
 4. periodically determining an amount of a current withdrawal payment;
 5. monitoring the account value for any unscheduled withdrawals made under the contract and making corresponding adjustments to future withdrawal payments; and
 6. paying the withdrawal payment to the owner;
- c) determining the account value to be annuitized at the end of the liquidity period; and
- d) during the annuity period:
1. determining the amount of an initial annuity payment;
 2. periodically determining an amount of a current annuity payment; and
 3. paying the annuity payment to the owner.

45. The method of Claim 44, wherein the special annuity factor is calculated at issue using the following formula:

$$\text{Special Annuity Factor} = \left[\sum_{t=1}^n v^t \right] + \left[v^n \times \sum_{s=1}^{\infty} v^s \times {}_s p_{x+n} \right]$$

Where:

$$v = 1/(1+\text{AIR})$$

$$\text{AIR} = \text{assumed investment rate}$$

$$n = \text{number of years in the liquidity period}$$

$$\sum v^t = \text{present value, discounting for interest only, of \$1 paid annually from } t=1 \text{ to } t=n$$

$$v^n = \text{present value, discounting for interest only, of \$1 paid at } t=n$$

$$\sum v^s \times {}_s p_{x+n} = \text{present value, discounting for interest and mortality, of \$1 paid annually from } s=1 \text{ to the end of the mortality table}$$

46. The method of Claim 44, wherein the initial withdrawal payment is calculated at issue using the following formula:

$$\text{Withdrawal}_0 = \text{Net Account Value}_0 / \text{Special Annuity Factor}$$

Where: Withdrawal_0 = initial withdrawal payment

$\text{Net Account Value}_0$ = initial account value, net of any initial charge for benefit guarantees

$\text{Special Annuity Factor}$ = special annuity factor calculated at issue.

47. The method of Claim 44, wherein withdrawal payments made subsequent to the initial withdrawal payment are determined by the following formula:

$$\text{Withdrawal}_{t+1} = \text{Withdrawal}_t \times [(1+i)/(1+\text{AIR})]$$

Where: Withdrawal_{t+1} = withdrawal payment made at time $t + 1$

Withdrawal_t = withdrawal payment made at time t

i = net fund performance during period t to $t+1$, minus any asset charge for benefit guarantees

AIR = assumed investment rate.

48. The method of Claim 44, wherein the account value during the liquidity period is determined by the following formula:

$$\text{Account Value}_{t+1} = (\text{Account Value}_t - \text{Withdrawal}_t) \times (1+i)$$

Where: Withdrawal_t = withdrawal payment made at time t

$\text{Account Value}_{t+1}$ = account value at time $t+1$

Account Value_t = account value at time t

i = net fund performance during period t to $t+1$, minus any asset charge for benefit guarantees.

49. The method of Claim 44, wherein an adjustment to future withdrawal payments is made whenever an unscheduled withdrawal is made, according to the following formula:

$$\text{Withdrawal}_{t+1} = \text{Withdrawal}_t \times (1 + \text{USWithdrawal}_t / \text{Account Value}_t) \times [(1+i)/(1+\text{AIR})]$$

Where: Withdrawal_{t+1} = withdrawal payment made at time t+1

Withdrawal_t = withdrawal payment made at time t

USWithdrawal_t = unscheduled withdrawal made at time t

Account Value_t = account value at time t, prior to the unscheduled withdrawal

i = net fund performance during period t to t+1, minus any asset charge for benefit guarantees

AIR = assumed investment rate.

50. The method of Claim 44, wherein the initial current annuity benefit payment is calculated at the beginning of the annuity period, or the end of the liquidity period, using the following formula:

$$\text{Annuity Benefit}_n = \text{Account Value}_n / \text{AF}_n$$

Where: Annuity Benefit_n = initial annuity payment made at time n

Account Value_n = account value at time n

AF_n = attained age annuity factor at time n.

51. The method of Claim 44, wherein annuity benefit payments subsequent to the initial benefit payment are determined by the following formula:

$$\text{Annuity Benefit}_{t+1} = \text{Annuity Benefit}_t \times [(1+i)/(1+\text{AIR})]$$

Where: $\text{Annuity Benefit}_{t+1}$ = annuity benefit paid at time t+1

Annuity Benefit_t = annuity benefit paid at time t

i = net fund performance during period t to t+1, minus any asset charge for benefit guarantees

AIR = assumed investment rate.